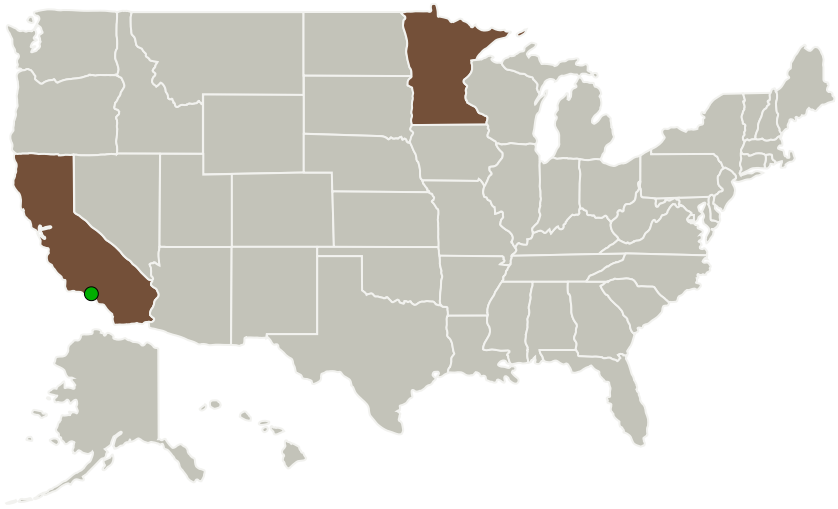
Monolithically integrated AlN/GaN electronics for harsh environments, Phase I

Completed Technology Project (2012 - 2012)

Project Introduction

Recently, resonant-tunneling-diode (RTD) based circuits employing monolithically-integrated RTD on high electron mobility (HEMT) structures have been developed in a number of III-V systems in order to improve operational speed. The main goal of this program is to develop wide temperature-operable radiation hard monolithically-integrated electronics based on wide bandgap III-nitride epitaxial structures. In the Phase I program, we propose to develop same-wafer discrete devices (capacitors, HEMTs, and RTDs) by employing a novel multi-layer AlN/GaN heterostructure design, and to demonstrate the radiation hardness of these devices

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
SVT Associates	Lead Organization	Industry	Eden Prairie, Minnesota
Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations	
California	Minnesota

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Project Transitions

February 2012: Project Start

August 2012: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138327)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

SVT Associates

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

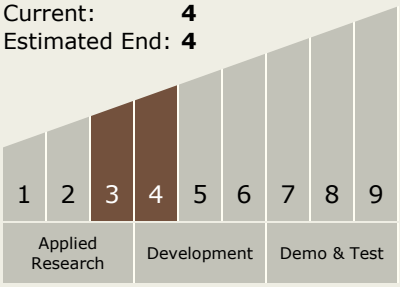
Carlos Torrez

Principal Investigator:

Amir Dabir

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX02 Flight Computing and Avionics
  - TX02.3 Avionics Tools, Models, and Analysis
    - TX02.3.2 Space Radiation Analysis and Modeling

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System